

City of Broken Arrow

COUNTY LINE MULTI-MODAL CORRIDOR OVERPASS

2019 BUILD GRANT APPLICATION



U.S. Department of Transportation
**FY2019 Better Utilizing Investments to
Leverage Development (BUILD) Application**

BUILD Funds Requested: **\$5,600,000**



Submitted by:

BROKEN ARROW
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U.S. Congressional
District OK-01

Project Name	County Line Multi-Modal Corridor Overpass
Applicant	City of Broken Arrow, Oklahoma
Project Partners	Indian Nations Council of Governments (INCOG) Oklahoma Department of Transportation (ODOT)
Contact Information	Alex Mills, Director of Engineering & Construction Department City of Broken Arrow 485 North Poplar Ave., Broken Arrow, OK 74012 918.259.2400 ext. 5380 Amills@brokenarrowok.gov
Project Location	City of Broken Arrow, Broken Arrow County Oklahoma Congressional District 1
Project Type	Urban, Road – Bridge Repair/Replacement
Project Description	<p>The City of Broken Arrow, INCOG, and ODOT are partnering to provide a multi-modal connection between north and south Broken Arrow to reduce congestion and improve the flow of people and goods along County Line Road. The Project will also replace the bridge over the Oklahoma State Highway (SH) 51. The Project will:</p> <ul style="list-style-type: none"> — Reconstruct and expand a one-mile stretch of the existing two-lane arterial road (County Line) to five-lanes — Replace, re-align, and build a bridge over SH-51 with a multimodal capacity — Improve and construct Americans with Disabilities Act (ADA)-accessible sidewalks, multi-use trail along the project corridor to connect a large public school with communities and development to the South of SH-51
Project Cost	\$19.53 million (2019 dollars)
BUILD Funds Requested	\$5.60 million (29%)
Other Federal Funds	\$7.00 million – Previously allocated Federal Surface Transportation Program (FFY 2008-13 STP) funds from INCOG, the MPO currently available to be spent on this project (36%)
Local Match Source(s) & Amounts	<p>\$2.93 million – City of Broken Arrow (FY2013 local match and bond revenues)</p> <p>\$4.00 million – Oklahoma Department of Transportation (FY 2020 Committed State Funds)</p> <p>Total Local Funds: \$6.93 million (35%)</p>
Project Schedule / Status	Categorical Exclusion (NEPA process) for the corridor was obtained in May 2013. Construction will begin in July 2020 and the project is expected to be complete in January 2023.
Project Benefits	<p>Once completed, this Project will:</p> <ul style="list-style-type: none"> — Improve Roadway Safety for personal vehicles and trucks — Improve pedestrian and bicyclist safety & health for students and residents — Improve access to jobs, and economic opportunity by linking rural areas with urban services — Reduce traffic congestion along County Line Road Corridor — Improve the air quality in the Tulsa Metropolitan area — Improve economic opportunities along the corridor for commercial and industrial firms
Benefit-Cost Analysis Results	Benefit-cost ratio: 1.3 (7% discount rate)
Project Website	http://www.brokenarrowok.gov/841/BUILD-Grant

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July 15, 2019

The Honorable Elaine L. Chao
Office of the Secretary
U.S. Department of Transportation
1200 New Jersey Ave SE
Washington, DC 20590

Dear Secretary Chao,

The City of Broken Arrow is pleased to submit this application for the County Line Multi-Modal Corridor Project (Project) under United States Department of Transportation's (USDOT) Better Utilizing Investments to Leverage Development (BUILD) program. **The request is for \$5.6 million in Federal BUILD funds for the Project, which is matched by \$6.93 million in state and local investment.** The City of Broken Arrow is the lead implementing agency, in coordination with the Oklahoma Department of Transportation (ODOT) with committed support of \$4 Million toward completion of the project. In addition, the City has also received annual funding allocations from the Indian Nations Council of Governments (INCOG), the MPO, Urbanized Area Surface Transportation Project (STP) funds for construction of the project. Any risk related to cost overruns beyond the already included 15% contingency funding and above the currently allocated amounts for the Project will be covered by the City of Broken Arrow, from local sources, since the City is committed to improving the County Line Road corridor.

The project consists of expansion of County Line Road, classified a principal arterial, between Houston and Kenosha Streets in Broken Arrow as well as replacement of an existing poorly aligned 2-lane bridge over SH-51 which is on the National Highway System (NHS). Improvements provided by this project include adding arterial roadway capacity which will relieve traffic congestion in the area by expanding the roadway from 2-lanes to 5-lanes. Safety is another added benefit of the project in two ways. First, safety will be provided by improvements to the poor alignment, both horizontally and vertically, of the existing roadway and bridge. Second, pedestrians and cyclists will be provided safe means of utilizing the corridor by the upgrades of existing, and addition of, new sidewalks which will be ADA compliant as well as the addition of a trail system along the east side of County Line Road.

Once complete, this project will replace a functionally obsolete arterial roadway bridge over one of the region's busiest expressways, to ensure safety and expanded capacity for years to come. These improvements will provide a multimodal corridor for use by pedestrians, cyclists, commuters, commercial freight, and motorists of both our rural and urban populations. The project will assist in economic development and creation of jobs by providing an improved corridor for transport of goods between our developing businesses areas and major routes of shipping like The Port of Catoosa. Additionally, the County Line Road project provides a better connection to not only Oklahoma's largest public high school with approximately 4,000 students but also to the Broken Arrow campus of Northeastern State University both of which serve our urban and rural populations. The County Line Road project improves the overall transportation system for the region and provides safer access for emergency vehicles.

The City of Broken Arrow is among one of the fastest growing communities in the State, with significant growth in the local economy and job market benefiting the region and the State of Oklahoma. Successfully delivering this project is necessary to improve the safety, quality of life, economic competitiveness and state of good repair for the City of Broken Arrow. We believe the Project is a strong candidate for BUILD funding with construction anticipated to begin in FFY 2020, July 2020.

We greatly appreciate the United States Department of Transportation's consideration of the requested investment in this Project as it is a critical corridor for the City of Broken Arrow, and of significance for the Counties surrounding Broken Arrow as well as the region.

Please contact Alex Mills, Director of Engineering & Construction Department, at 918-259-7000 x 5380 if you have any further questions regarding this project.

Sincerely,

A handwritten signature in black ink, reading "Michael Spurgeon". The signature is fluid and cursive, with a long horizontal stroke at the end.

Michael Spurgeon
City Manager

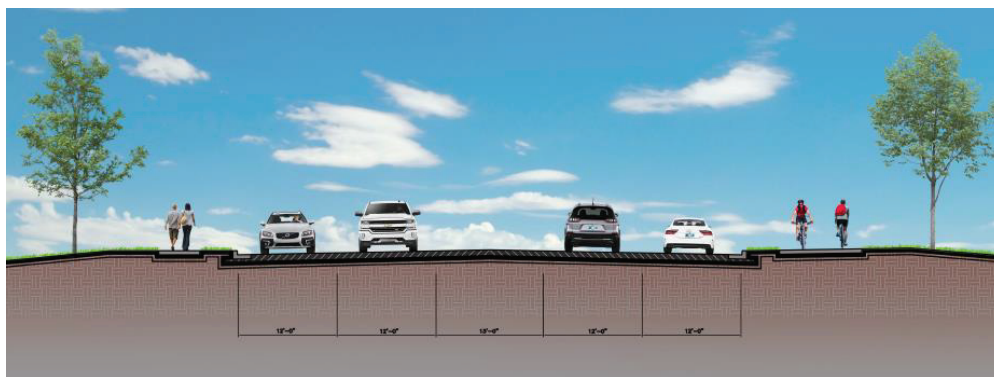
cc: Craig Thurmond, Mayor
Kenny Schwab, Assistant City Manager of Operations
Alex Mills, Director of Engineering & Construction

1. PROJECT DESCRIPTION

The City of Broken Arrow, Oklahoma (OK) is requesting \$5.60 million in Better Utilizing Infrastructure to Leverage Development (BUILD) funding for the \$19.53 million County Line Multi-Modal Corridor Overpass Project (the Project).

The Project will improve safety, reduce congestion, and improve the flow of people and goods to urban and rural areas along the County Line Road corridor in Broken Arrow. Specifically, the improved corridor

Figure 1. Roadway Sectional Rendering of Project



will be able to accommodate growing commercial traffic between the City of Coweta, the City of Broken Arrow, and the Port of Catoosa, as well as connecting the rural and urban populations to job centers. The Project will generate a multitude of benefits along the corridor, including improved safety to motorists, pedestrians and bicyclists, reduced traffic congestion, improved air quality in the Tulsa Metropolitan Area, enhanced access for urban and rural communities to jobs, and bolstered economic opportunities for existing and future commercial and industrial businesses located along the corridor. Once complete, this project will replace a principal arterial roadway bridge over one of the region's busiest expressways, to ensure safety and expanded capacity for years to come.

The project is to reconstruct an unsafe, one-mile principal arterial, to the standard as depicted in **Figure 1**, County Line Road (section-line road bordering two counties) to accommodate current and future traffic - and replace existing 2-lane bridge spanning SH-51 (current bridge is shown on the cover). The full project location is shown in **Figure 2**. Both the street and the bridge need several improvements, which include:

- Street reconstruction, including street widening to accommodate increased traffic;
- Bridge replacement, the existing bridge needs a new horizontal and vertical alignment;
- Bridge widening, since it does not currently have a curb with a sidewalk;
- Bridge multi-modal connectivity to school and neighborhoods;
- Multi-use trail addition; and
- Construction of Americans with Disabilities Act (ADA)-compliant sidewalks and ramps.

The BUILD request of \$5.60 million would be leveraged with \$7.00 million in previously allocated federal Surface Transportation Program (STP) funds from the MPO, \$2.93 million of local funding from the City of Broken Arrow, and \$4.00 million of state funding from the Oklahoma Department of Transportation (ODOT), for a total 35% in non-federal match and 71% non-BUILD Grant.

The Project will improve safety, reduce congestion, and improve the flow of people and goods to urban and rural areas along the County Line Road corridor in Broken Arrow.

The Project complements approximately \$25 million of state and local investment in street and highway rehabilitation and widening projects within the immediate corridor region by all partners mentioned in this application. This additional investment by Broken Arrow and ODOT exemplifies both the need to revitalize the corridor for residents, and the dedication and partnership of local groups and public agencies to realize the necessary results.

1.1. Project Elements

ODOT is the lead implementing agency, and will be leading the construction of the five key Project elements, summarized in the following table:

Table 1. Project Elements

Project Element	Description	Benefit to Corridor
Roadway Widening	Construct a five-lane roadway by adding an additional lanes (2-12') in each direction with a center left turn lane to for the five-lane 61' wide roadway.	Improves traffic flows and safety, by reducing congestion and traffic crashes. Improves access to goods, services, and places of employment across and beyond the one-mile corridor for bicyclists, pedestrians, personal and commercial traffic.
Bridge Widening & Lengthening	Replace current two-lane bridge with a new five-lane, multi-modal bridge. Install an additional lane in each direction and a center left turn lane to create a 5-lane 61' wide roadway. Install attractive, safe bridge rail on each side of the bridge. Lengthen bridge, adjust both the horizontal curve and vertical curve alignments for traffic safety. Build the bridge to serve as be the north-east gateway to the City of Broken Arrow, by adding the Broken Arrow emblem relief to the center pier cap end and decorative concrete form liners to bridge abutments/wings.	Improves safety and traffic flow, by reducing congestion and traffic crashes. Improves access across the corridor to pedestrians, cyclists, personal and commercial traffic, goods, services, and places of employment.
West Sidewalk	Install a 5-foot sidewalk on the west side of roadway close to the right-of-way	Improves pedestrian safety, mobility, and access.
East Trail	Install a 10-foot wide asphalt trail on the east side of roadway close to the right-of-way. A 4-foot minimum grass area will be located between the curb and trail with a 2-foot minimum from the right-of-way line.	Improves pedestrian and cyclist safety, mobility, and access.
Additional Lane on Broken Arrow Expressway	Install an additional lane in the east bound direction to provide three through lanes of traffic on east bound SH-51 from Kenosha (71 st St) east bound on ramp to the east bound exit ramp to SH-51 at the beginning of the Muskogee Turnpike (SH-351).	Improves traffic flows and safety, reducing congestion and traffic crashes. Improves access across the corridor to goods, services, and places of employment.

The following **Figure 3** depicts the Project rendering.

Figure 3. Project Corridor Rendering

1.2. Corridor Description

The County Line corridor is a crucial multi-modal, multi-jurisdictional transportation facility that transports people, goods and products in and around Broken Arrow and to and from the Tulsa metropolitan area to other local, regional, and interstate destinations. The corridor is the border between Tulsa (largely urban) and Wagoner (mainly rural) counties, and extends through the cities of Broken Arrow, Tulsa, and Catoosa. In addition, the overpass at the Broken Arrow Expressway (SH-51) is situated at a key juncture of two significant highways (SH-51 and SH-351), and two county jurisdictions, one primarily rural & one primarily urban. SH-51 is also recognized as part of the National Highway System (NHS). More corridor information is listed in Section 2 - Project Location.

1.3. Addressing Transportation Challenges

The project has been designed to address four (4) challenges facing the regional economy and users of the corridor:

- Unsafe travel conditions for personal and commercial vehicles, pedestrians, and bicyclists due to a lack of sidewalk facilities and unsafe embankments and curves,
- Traffic congestion for all motorists,
- Limited connectivity to the largest public high school in the state, and the Northeastern State University Broken Arrow campus, and
- Restriction to the flow of goods, services, and people

Current conditions pose **unsafe travel conditions** with steep embankments, with no shoulders, at the bridge termini. Even with reduced speed, it is not the recommended route for trucks or heavy vehicles. SH-51 splits the City of Broken Arrow into two—north and south—without no connection for pedestrians and bicycle users at this principal arterial section-line. The existing lane structure and merging configurations—a reduction from three travel lanes to two as east bound SH-51 highway approaches the County Line Road overpass near the SH-51/Muskogee Turnpike split—creates an unsafe condition for drivers on both roadways. In addition, the current horizontal and vertical alignment of the overpass, which curves as it

crosses SH- 51, presents a major safety hazard for all vehicles including heavy vehicles that seek to access the Port of Catoosa, a few miles to the north of this facility.

The Project will improve the safety for vehicular traffic by installing an additional lane to provide travelers of SH-51 with the needed capacity to merge eastbound. Additionally, the overpass will be improved by lengthening it to accommodate future needs of the expressway beneath, adjusting the vertical alignment to improve line of sight issues, and straightening the horizontal alignment, removing unnecessary horizontal curves which exacerbates safety concerns on the existing bridge. These adjustments will comprehensively improve the travel conditions along both the corridors of SH-51 and the primary project area of County Line Road.

The proposed Project will incorporate sidewalks and a multi-use trail to provide a protected and safe means of transport for pedestrians and cyclists. These improvements will eventually serve as a critical link to the Liberty Parkway Trail system, which in turn provides another major link to the existing 130 miles of Tulsa Area Trails and Bikeways. Collectively, these improvements along with the Tulsa Area Trails and Bikeway system will provide access for Tulsans, as well as for regional residents in outlying communities.

The overpass as it exists—a two lane federally classified Principal Arterial (PA)—restricts the flow of traffic to and from Tulsa region, causing **traffic congestion**. Additionally, significant development has occurred along the corridor since the narrow bridge was first built five decades ago, including the new Broken Arrow Public Schools campus expansion and the new Northeastern State University Broken Arrow campus, which has increased traffic congestion in the corridor over time. The Project will address and mitigate traffic congestion by installing additional travel lanes to accommodate current and future traffic volumes.

County Line Road is a major connection from south Broken Arrow—where a new public university campus, Northeastern State University-NSU, a large Boy Scouts campus, and various trail connections to the metropolitan region are located—to Interstate 44 in east Tulsa (seven miles north) and further north to the Port of Catoosa (12 miles north). Commercial trucks as well as private vehicles use County Line Road heavily, however, existing conditions **restrict the flow of traffic and hinder the flow of goods, services, and people**. County Line Road provides a vital link from the Creek Turnpike South Loop (SH-364) in south Broken Arrow north to Interstate 44 and beyond to the Port of Catoosa. At present the roadway is mostly a two-lane rural “section line” roadway that is grossly overloaded. The Project improves travel conditions for all travelers and reduces congestion to enable the mobility of goods, services, and people.

1.4. Project Benefits

INCOG, the Metropolitan Planning Organization (MPO) for the Tulsa region, has prioritized the Project for the long-range transportation plan for over two decades. The Project was first selected for funding by the MPO through the regional Surface Transportation Project (STP) selection process in 2008, over a decade ago for preliminary engineering, environmental clearance, and right-of-way. Several additional funding rounds have been completed and the project is ready for construction in the Tulsa Transportation Management Area (TMA), with 95 percent design plans complete and an approved categorical exclusion (CE), completing the National Environmental Policy Act (NEPA) approval process. The CE is currently in the process of being reevaluated and updated given that several years have passed since the initial approval. A gap in funding has delayed this already federalized project by a decade & the BUILD grant will accelerate the construction and optimize the benefits to the community and the region.

The City of Broken Arrow and INCOG have prioritized the Project based on the following benefits it is expected to generate (**Table 2**). These benefits are described in more detail in Section 4 of this application.

Table 2. *Project Benefits*

Merit Criteria	Project Benefits
Safety	The Project will improve safety for vehicular travelers, pedestrians and bicyclists. The center left turn lanes will reduce rear end collisions. The bicycle trail will remove bicyclists from the travel lane and from conflict with motorized vehicles. Installing a sidewalk will remove pedestrians from the travel way. Revised horizontal and vertical alignments provided by the Project will also improve safety along the corridor by increasing sight distances.
State of Good Repair	Replacing the roadway and bridge will reduce maintenance cost in the corridor. The new assets will have an extended design life compared to the existing assets. The new bridge will have a design life of 50 years with minimal maintenance. The pavement will have a design life of 20 years with minimal maintenance.
Economic Competitiveness	The roadway and bridge improvements will improve flow of traffic along County Line Road and SH-51. These critical links will enable the movement of goods and services through the corridor. Higher, more efficient average speeds will also result in reduced fuel costs.
Environmental Sustainability	Improved flow of traffic will reduce idling, including the left turn lane, which will reduce greenhouse emissions and localized tail-pipe pollutants.
Quality of Life	The larger right-of-way will enable more efficient movement for vehicle/truck traffic, pedestrians, bicyclists, and emergency vehicles. Improved movement will improve access to healthcare, educational, and recreational facilities.

2. PROJECT LOCATION

Project Coordinates: Latitude 36.0556° N, Longitude: 95.7619° W

The BUILD Project is located within Oklahoma's First Congressional District in the City of Broken Arrow (**Figure 4**), which straddles both Tulsa County and Wagoner County. The Project elements are located on one of the city's major arterial corridors. The overpass in the project area is located at an essential transportation junction at which Oklahoma State Highway 51 (SH-51) merges with the Muskogee Turnpike (State Highway 351, SH-351). This junction, coupled with the bridge feature, serves as a major gateway not only to Broken Arrow, but also to the entire Tulsa Metropolitan Area from the southeast. The infrastructure within the project location serves as a major connection point, as described below:

Figure 4. Downtown Broken Arrow



- The **County Line Corridor** is a critical north-south arterial street that borders Tulsa County to the West and Wagoner County to the east, including each county's neighborhoods, employment centers, commercial areas, and schools.
- The **overpass at the Broken Arrow Expressway** is a crucial connection point to north & south Broken Arrow, along with other areas of the region, including connecting to the Muskogee Turnpike (SH-351), which connects Muskogee, one of the leading cities in the state, and Interstate 40 (I-40) to the Tulsa metropolitan area and connects Broken Arrow to the Port of Catoosa as seen in .

The City of Broken Arrow is dedicated to enhancing the County Line Corridor to first and foremost create a safer traveling experience, but also link diverse areas and demographics of Tulsa and Wagoner counties, as described below. **Figure 5** illustrates a context map of the Project location and **Figure 6** illustrates a detailed project area map.

Figure 5. Project Location Map

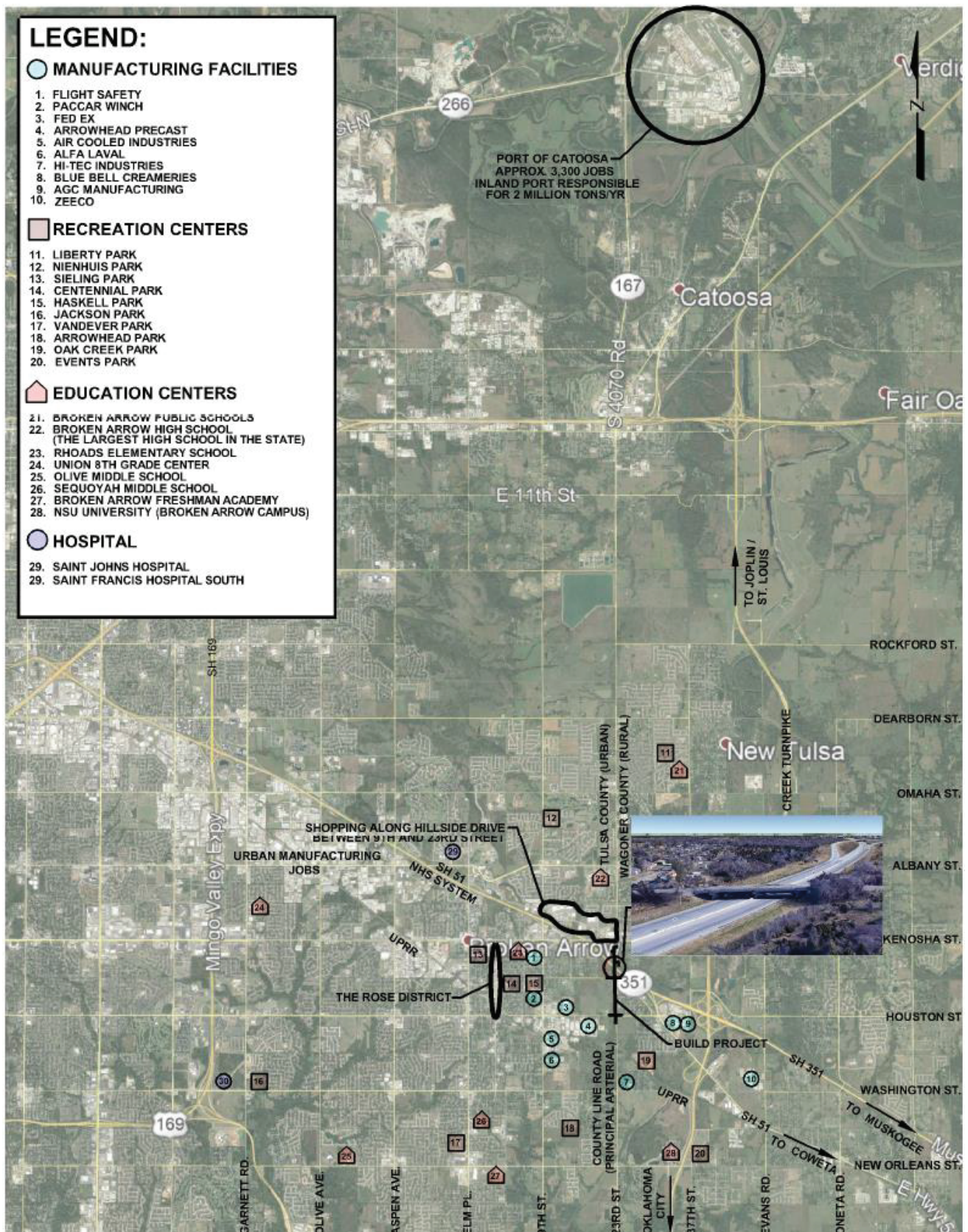


Figure 6. Detailed Project Area Map

2.1. Key Traveler Demographics

Table 3 and **Figure 7** summarizes corridor and city demographic information, highlighting how the project corridor population is underserved in comparison to the population within the entire City of Broken Arrow. Additionally, the demographics highlight how car-dependent the project corridor population is—with nearly all households owning a car, and there are no public transit options in the corridor area—further emphasizing the need to improve the infrastructure. In addition:

- Minorities make up roughly 25% of the population of the corridor
- The population is aging in this area, with 13% of the population over the age of 65
- Two high poverty census tracts are located within one-square-mile areas in the near vicinity of the project area. One is the square mile from County Line east to 37th Street (209th E. Ave.), from Kenosha Street (71st St. S.) north to Albany Street (61st St. S.). The second is from County Line west to 9th Street (Lynn Lane, 177th E. Ave.), from Houston Street (81st St. S.) north to Kenosha

Street (71st St. S.). These two areas will benefit most from the corridor widening, particularly the provision of pedestrian and bicycle links from housing to employment opportunities on both sides of SH-51

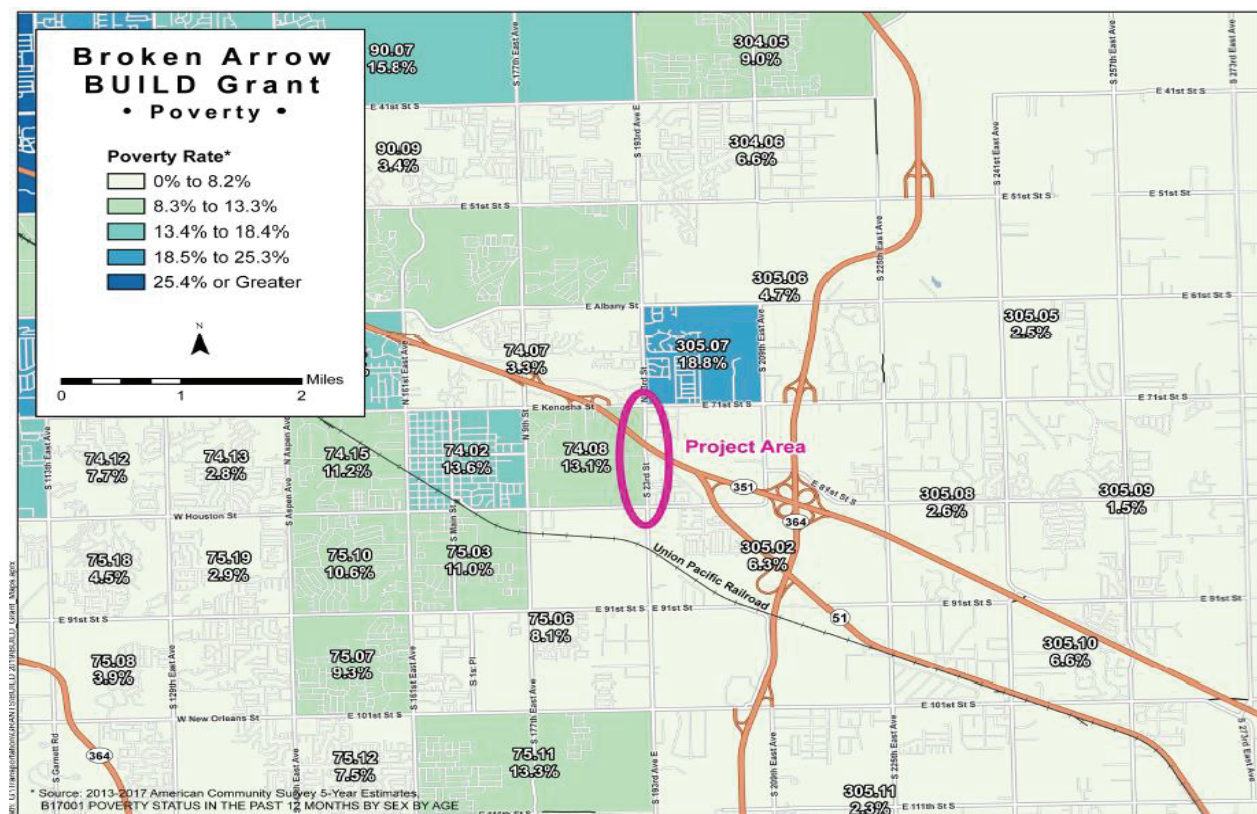
— A federally designated Opportunity Zone is located roughly a mile west of the project area

Table 3. Project Demographic Profile

	Project Corridor (within 1-mile of Project)	City of Broken Arrow (within 2-miles of Project)
Population	989	30,177
Total Employed	516	15,035
Total Unemployed	2.1%	3.2%
Median Household Income	\$53,150	\$57,519
Per Capita Income	\$23,340	\$28,154
% of Population in Poverty	8.6%	7.6%
% Zero-Car Households	1.9%	3.5%

Source: American Community Survey 2012-16 (2018 Estimates); American Community Survey 2013-2017

Figure 7. Poverty Map



2.2. Major Activity Centers

- The project will aid in facilitating access to a plethora of major commercial, residential and essential services along the corridor (**Figure 5** and **Figure 6**). The County Line Corridor is the main gateway into the City of Broken Arrow and is a major thoroughfare to reach the following activity centers: Commerce and jobs situated on the north side of the corridor
- Educational centers including several Broken Arrow Public School facilities (the largest high school in the state) and Northeastern State University
- Manufacturing facilities, including companies such as Blue Bell Creameries, AGC Manufacturing, Arrowhead Precast, Air Cooled Exchangers, Flight Safety, Zeeco, Hi-Tec Industries OK, Alfa Laval, amongst others
- The Port of Catoosa
- Hospital facilities
- Recreation centers

Figure 8 highlights several existing key destinations and activity centers within one mile of County Line Road Project.

Destinations such as Northeastern State University, will be much more accessible to the residents from north parts of Broken Arrow.

Figure 8. Major Activity Centers along the Project Corridor (County Line Road)



3. GRANT FUNDS AND SOURCES/USES OF PROJECT FUNDS

The City of Broken Arrow is requesting \$5.60 million of the Project's total costs from BUILD funding to leverage local and state funding sources from the City of Broken Arrow and ODOT. The Project's funding plan is presented below.

3.1. Capital Sources of Funds

The total project cost is \$19.53 million in 2019 dollars. The following section describes the breakdown of the funding sources.

Non-federal Funds: a total of \$6.93 million from local and state sources will supplement the total project cost, including:

- **State Funds:**
 - **ODOT:** \$4.00 million of the state match will be funded through ODOT as indicated in ODOT's 8-Year Construction Work Plan (Included on the Project website)
- **Local Funds:**
 - **City of Broken Arrow** (Local Match for STP Funds, 2008-2011; Bond Match Funds): \$1.53 million of the local match will be funded by the City of Broken Arrow through the local match funds set aside for the STP funds
 - **City of Broken Arrow** (Bond Match Funds, 2008-2011): \$1.40 million of the local match will be funded by the City of Broken Arrow through bond revenue

Federal Funds: a total of \$12.60 million in federal funds will go towards this project, including:

- **BUILD Funds:** \$5.60 million in federal discretionary funds
- **Federal STP Funds:** \$7.00 million in 2008-2014 Surface Transportation Program (STP) Urbanized Area (UZA) funds previously allocated by INCOG

The Appendix and Project website contain the letter of financial commitment from ODOT.

Table 4 and **Table 5** show the project capital budget by funding sources (federal and non-federal Funds), by percent of total, and by annual source.

Table 4. Project Capital Budget Summary by Source (2019\$ Millions)

Funding Source		Total Funding Amount (\$ Millions)	Percent of Total
BUILD Funds	BUILD Grant Funds	\$5.60	28.7%
Federal Funds	Federal STP UZA Funds	\$7.00	35.8%
	Total Federal Funds	\$12.60	64.5%
Non-federal Funds	ODOT (State Match)	\$4.00	20.5%
	City of Broken Arrow (Local Match)	\$2.93	15.0%
	Total Non-Federal Funds	\$6.93	35.5%
Total Project Cost		\$19.53	

Table 5. Project Capital Budget Summary by Annual Source (2019\$ Millions in Federal Fiscal Year - FFY)

Funding Source	FFY 2020	FFY 2021	FFY 2022	FFY 2023	Total
Federal Funds					
BUILD Grant Funds	\$0.00	\$5.00	\$0.60	\$ -	\$5.60
Federal STP UZA Funds	\$1.00	\$2.00	\$4.00	\$ -	\$7.00
Non-Federal Funds					
ODOT (State Match)	\$1.56	\$1.81	\$0.63	\$ -	\$4.00
City of Broken Arrow (Local Match)	\$0.25	\$0.57	\$0.72	\$1.39	\$2.93
Total Project Funding Sources	\$2.81	\$9.38	\$5.95	\$1.39	\$19.53

3.2. Capital Uses of Funds

As described above in Section 3.1, the federal and non-federal funds will cover the total Project costs as listed in **Table 6**. The total cost of the Project is \$19.53 million in 2019 dollars and \$18.90 million in 2017 dollars (as listed in the BCA Section 6 and the BCA Technical Memo due to the USDOT guidance).

Table 6. Project Capital Budget Summary by Use (2019\$ Millions)

Funding Use	FY 2020	FY 2021	FY 2022	FY 2023	Total
Construction Total	\$2.26	\$7.50	\$4.76	\$1.11	\$15.63
Construction of Roadway	\$1.58	\$5.25	\$3.00	\$1.11	\$10.94
Construction of Bridge	\$0.68	\$2.25	\$1.76	\$ -	\$4.69
Contingency (15%)	\$0.34	\$1.13	\$0.71	\$0.17	\$2.34
Construction Management & Inspection (10%)	\$0.22	\$0.75	\$0.48	\$0.11	\$1.56
Total Project Funding Uses	\$2.81	\$9.38	\$5.95	\$1.39	\$19.53

Roughly, \$1.31 million of funds (2017 dollars) has already been expended on the project:

- Plans, Specifications, and Estimates: \$1.30 million (funded with local STP funds from INCOG combined with local match as required by the City of Broken Arrow)
- Environmental - \$0.10 million (funded by ODOT)

3.3. Summary of Operating Sources and Uses

After the Project construction is complete, the annual operations and maintenance (O&M) costs of the Project are estimated to be \$20,000 annually (2019\$). The O&M costs include the costs for the City of Broken Arrow to maintain the asphalt, sidewalks, multi-use trail, ADA-compliant ramps, and the overall condition of the bridge. The City of Broken Arrow will absorb these costs within its annual maintenance budget. The BCA analysis and corresponding narrative reflects the ongoing O & M costs.

4. MERIT CRITERIA

4.1. Primary Selection Criteria

In accordance with the United States Department of Transportation's (USDOT) BUILD Notice of Funding Opportunity (NOFO), a description of the Project's quantitative and qualitative primary selection benefits is included below.

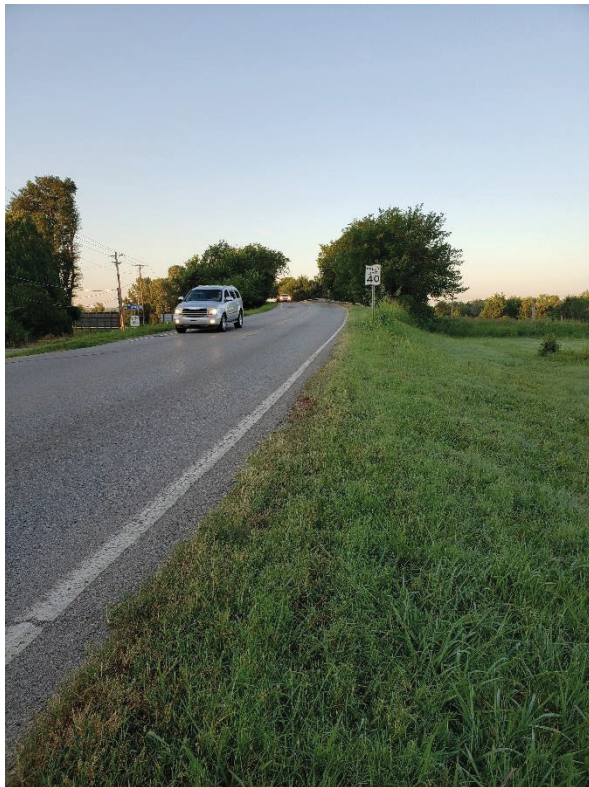
Safety

The existing road and overpass have reached and exceeded its useful life, and currently presents unsafe conditions for travelers. Collision data obtained from INCOG for the years 2013-2017, which can be found in **Table 7**, demonstrates that the corridor experiences on average 61 collisions a year, and that on average there is one traffic collision each year that results in an incapacitating injury. Most of the collisions were rear- end collisions which are prevalent on two-lane facilities that have cross street intersections. Traffic waiting to turn not only holds up through traffic, but it can cause collisions with required reduction in speed conditions with regard to the curvature and embankment as you approach the mile section. The improved facility with a dedicated turn lane and adjusted horizontal and vertical alignments to improve line of sight will reduce the collision rate by one-third in the first year of operations and reduce total collisions by three percent in all succeeding years. The reduction in collisions will nearly eliminate the annual incapacitating collision, and reduce the annual average of no injury collisions from 37 to roughly 12. This reduction will greatly improve safety for all travelers on the corridor. These benefits are estimated from similar travel conditions for other safer facilities.

Table 7. Corridor Collisions 2013-2017

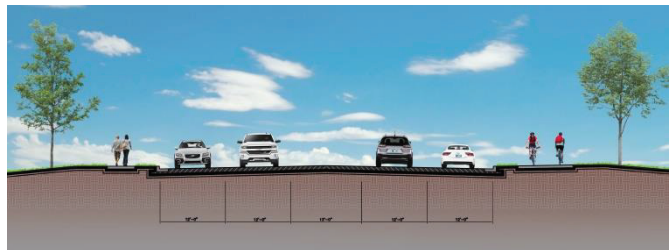
Collision Type	2013	2014	2015	2016	2017	Annual Average
Killed	-	-	-	-	-	-
Incapacitating	3	1	-	1	-	1
Non-Incapacitating	12	4	10	11	9	9
Possible Injury	11	9	12	20	19	14
No Injury	29	46	31	45	35	37
Total	55	60	53	77	63	61

In addition to safety benefits to motorists, the Project will improve safety for cyclists and pedestrians who travel along the corridor. The multi-use path will enable the large high school student population to the north as well as the NSU campus to the south access their facilities safely by bike and by foot. In addition, the path will provide a safer connection to the existing trail system in Broken Arrow as well as the entire Tulsa regional trail system. Pedestrians will also see safety benefits from the sidewalk and protections from traffic. After the Project is executed, pedestrians will be able to access both the north and the south sides of SH-51 and access neighborhoods as they are currently divided by the expressway (**Figure 9** and **Figure 10**).

Figure 9. Bridge with Embankment**Figure 10.** Bridge with Embankment, Lack of Shoulder, Pedestrian/Bike connectivity

State of Good Repair

The widening of County Line Road will replace existing assets that are aged, and inadequate, with a “fair” condition rating from the Federal Highway Administration’s (FHWA) *Pavement and Bridge Condition Performance Measures*, posing a safety risk to travelers. Both the roadway and bridge are beyond their anticipated life expectancy. The existing road surface has numerous deteriorated areas caused by the high volume of traffic on an undersized facility, causing additional premature failure of the facility. Additionally, traffic volumes are anticipated to increase in the future. The bridge is narrow and has skewed vertical and horizontal alignments.

Figure 11. Roadway Sectional Rendering

The Project will address the deficiencies rated as “fair” based on National Bridge Inventory (NBI) definition and will improve the state of good repair of the assets. The Project will replace the bridge and increase the capacity of the bridge to accommodate existing and future traffic flows. The Project will also accommodate adding eastbound lane on the expressway under the overpass. With respect to the road, the Project will provide two lanes in each direction along with a dedicated left turn lane to improve the state of the road and add capacity (**Figure 11**).

Overall, the Project will address the poor condition of the asset as it exists, which poses a threat to transportation network efficiency, safety, and the mobility of goods, people and services throughout the

Figure 12. Bridge Elevation Sectional Rendering



corridor and future growth in the region (Figure 12). ODOT and Broken Arrow have sufficiently considered the needed operations and maintenance and rehabilitation and replacement costs required to maintain the new facility into the future.

Economic Competitiveness

County Line Road provides a vital link from the Creek Turnpike South Loop (SH-364) in south Broken Arrow north to Interstate 44 and beyond to the Port of Catoosa. The current roadway primarily consists of a two-lane rural “section line” roadway that is unsafe for travelers, experiences congestion, and is expected to experience a nearly three percent annual increase in the number of vehicles that travel the corridor each day. **Table 8** provides an overview of the expected increase in traffic over time. As a result, the two-lane road will not have the capacity to handle increased traffic flows and left unchanged, congestion in the corridor would be exacerbated. Based on current speed patterns within the corridor, travelers would save 50 seconds per passenger per trip during peak hour travel and 30 seconds per passenger per trip during off-peak hour travel. The analysis concluded that the time savings benefits for this Project would be \$12.9 million (2017 dollars, discounted at seven percent).

Table 8. Total Traffic Per Year in the Project Corridor (2018-2022) (Annual Vehicle Miles Traveled (VMT))

Year	Traffic Count (VMT)
2018	4,856,690
2019	5,001,722
2020	5,151,085
2021	5,304,909
2022	5,463,326

Widening County Line Road will help to decrease the congestion along this corridor, facilitate more efficient access to goods, services, and places of employment, thus bolstering the region’s economic competitiveness. The Project is vital to the economic competitiveness of Broken Arrow and is part of the city’s comprehensive plan. The Project improvements will facilitate access to the following locations:

- A large newly developing commercial area north of the project area
- Existing light industrial areas at the south end of the corridor
- The Tulsa Port of Catoosa connectivity to the rural areas of the region
- The I-44 corridor, which connects Tulsa, Oklahoma City, and Lawton—three of Oklahoma’s largest urban centers.

Providing faster and more reliable access to these locations will not only serve the residents of Broken Arrow, but also benefit the economic competitiveness of these locations, especially the Port of Catoosa. The Port of Catoosa acts as a hub for industries located in the Tulsa region, with 70 companies and 3,300

“This project will enhance the objectives of the Broken Arrow Public Schools.”
Jane C. Dunlop, Ph.D. (Superintendent of BAPS)

jobs located at the Port and approximately two million tons of goods are shipped each year from the Port. The Port provides a valued annual economic impact of \$300 million to the state of Oklahoma.¹ The Port helps to support the economic competitiveness of the region. This project will provide necessary, safer connection to rural region to the south.

The project will improve the movement of pedestrians and cyclists, which will also improve the region’s economic competitiveness. The relatively recent addition of commercial areas on the north side of SH-51, including small- and large-scale retail, medical, hotels, and banking provides employment opportunities for residents on both sides of the state highway. Providing bicycle and pedestrian access, as well as improving vehicular access, across the County Line Road bridge will greatly enhance the availability of these jobs to the residents on the south side. In addition, an industrial park along Houston Street is another employment center that will become more accessible for residents north of SH-51.

Environmental Sustainability

The Project will widen the overpass and County Line Road to better accommodate current and future traffic flows. The wider street will improve the flow of traffic within the corridor, which will reduce idling times, and reduce vehicle hours traveled for trucks and automobile drivers. As mentioned in the section on Economic Competitiveness, based on current speed patterns within the corridor, travelers would save 50 seconds per passenger per trip during peak hour travel and 30 seconds per passenger per trip during off-peak hour travel. Improved and more efficient traffic flows will reduce the amount of fuel consumed by drivers. This will have localized and wider environmental benefits.

The Project improvements will also help to reduce Tulsa County’s localized ozone concentration. Tulsa County is currently in attainment for ground level ozone but is at risk of non-attainment. Reducing congestion and subsequently reducing greenhouse gas emissions and localized air pollution will help the region to meet the expected ozone levels and improve air quality for residents.

The Project also includes connecting pedestrian and bicycle infrastructure improvements throughout the corridor. Establishing this infrastructure will help to encourage the use of green mobility—walking and cycling over driving—will help to reduce environmental impact and improve environmental quality in the region. Specifically, this modal switch will also contribute to a reduction in greenhouse gas emissions in the corridor and improved localized air quality for residents.

Quality of Life

A primary advantage of an improved and wider street and overpass facility is the ability to provide reliable and continuous connectivity to goods, services, and essential facilities for travelers. The County Line Road corridor provides connection to a wide array of services for local residents, including two school facilities for

¹ “About the Port of Catoosa.” <<https://www.tulsaport.com/about/>>

the Broken Arrow school district (**Figure 13**), the Northeastern State University Broken Arrow campus, an urgent care clinic, a Walmart store, several companies, and recreational facilities including a recently finished Boys Scouts facility.

The Project will improve access and quality of life in the corridor for vehicular travelers, pedestrians, and cyclists alike. The Project will widen the road and

Figure 13. Broken Arrow High School



overpass, allowing vehicular travelers easier and safer access to these destinations. Particularly, widening the roadway will allow for better access to the Broken Arrow Public School since County Line Road is a major access road for public school buses. In fact, the public-school bus depot is located just west of County Line Road north of College. Additionally, widening the road and the overpass will enable emergency vehicle to pass through the area with limited disruptions avoiding congestion. The addition of the sidewalk and trail will allow the pedestrian and bicyclist to access the area without having to share the facility with motor vehicles. Further, the new trail will connect pedestrians and cyclists to existing trails in the Tulsa region, facilitating enhanced access to other areas of the community. Constructing ADA-compliant sidewalks and ramps will provide a safer and separate mode of travel than from roadway traffic to the elderly, disabled and disadvantaged population.

Additionally, the design of the bridge is intended to convey a gateway purpose to the City of Broken Arrow. The bridge on County Line Road over SH-51 (and west entrance to the Muskogee Turnpike) will greet travelers with an aesthetically pleasing entrance. Both on SH-51 and County Line Road the gateway will give travelers a desire to enter the City. It will take a transforming a typical bridge structure and make it into a symbol for the community.

4.2. Secondary Criteria

In accordance with the USDOT BUILD NOFO, a description of the Project's quantitative and qualitative secondary selection benefits are described below.

Innovation

The Project development and implementation processes will feature innovative elements, including NEPA delegation authority, project development partnerships, and robust project implementation partnerships to expedite the project delivery timeline. For NEPA compliance, Broken Arrow has delegated all responsibility for this project element to ODOT. ODOT, as a state agency with resources and experience in leading and managing the NEPA compliance process, provides valuable expertise to ensure that the project is on schedule and on budget. Also, in the project development phase, Broken Arrow has partnered with ODOT in completing the project design and preparation. This partnering will further help speed up the project in its construction phase.

During the project implementation phase, Broken Arrow will again be partnering with ODOT to deliver the project. This collaboration will allow Broken Arrow and ODOT to combine resources and support to provide enough time, expertise, and management to ensure the project is delivered on time. Overall, the partnerships will allow the Project to meet the proposed timeline, meet the Project objectives, and realize the Project benefits. The innovative bidding process employed by ODOT on its state and federal projects will be of most help in reducing the downtime for the existing critical link or nearly eliminating it for any construction sequence.

Partnership

The BUILD Project demonstrates strong collaboration from local, regional, and national partners. ODOT will be leading the project as the fiduciary agent for urbanized funds allocated by INCOG, the MPO. The City of Broken Arrow utilizes the ODOT procurement for all consulting, engineering, and construction by an

"When completed, the arterial roadway project will provide for a connection to the Port of Catoosa, serve both nearby urban and rural areas, and improve the overall transportation system for the region."

Rich Brierre, Executive Director, INCOG

agreement in compliance with 23 Code of Federal Regulations (CFR). Additionally, the Project will have support from key collaborative and invested partners, including ODOT and INCOG. INCOG is also a key project partner, providing support for the project development and overall completion of the BUILD Project. Several other partners have provided letters of support for the BUILD Project, including ODOT Division I and VIII, Oklahoma Turnpike Authority, Senator Inhofe, Congressman Hern, Tulsa County, Wagoner County, Broken Arrow Chamber, Broken Arrow Public Schools, and Northeastern State University.

The City of Broken Arrow has partnered with several public agencies to deliver past projects. Each partner is profiled below and **Table 9** lists the projects.

Oklahoma Department of Transportation (ODOT): The Oklahoma Department of Transportation (ODOT) is the agency of the government of Oklahoma responsible for the construction and maintenance of the state's transportation infrastructure. ODOT partners with all jurisdictions that use federal money to fund projects, as the State's NEPA delegation authority.

Oklahoma Turnpike Authority (OTA): The Oklahoma Turnpike Authority (OTA) is a government agency of Oklahoma that deals with issues regarding the Oklahoma turnpike system. Along with the Oklahoma Department of Transportation, the Authority is the primary infrastructure construction and maintenance agency of the State.

Wagoner County: Wagoner County is a county in Oklahoma with a population of roughly 80,000 people. The county borders Tulsa County to the southeast. The county is included in the Tulsa Metropolitan Statistical Area (MSA).

City of Coweta: The City of Coweta is located in Wagoner County, Oklahoma, with a population of roughly 10,000 people. The city is located roughly ten miles southeast of the Project corridor.

Tulsa County: Tulsa County is the largest county in Oklahoma. The county borders Broken Arrow to the northwest. Tulsa County is the second most populous county in Oklahoma, behind Oklahoma City, with a population of 650,000.

Table 9. List of Partners and their Complementing Projects in the Vicinity

Partnered with:	Projects
ODOT, Wagoner County and City of Coweta	<ul style="list-style-type: none"> — Roadway improvements on New Orleans St (101st St) from 79th St (Midway Rd) east approximately ½ mile and 79th St (Midway Rd) from SH-51 to New Orleans St (101st St) approximately 1,640 lf for new National Guard Armory — Roadway improvements on New Orleans St (101st St) from NSU BA Campus to SH-51
Tulsa County	<ul style="list-style-type: none"> — Roadway improvements on 23rd St (193rd E Ave or County Line Road) from the Creek Turnpike to New Orleans St (101st St) — Roadway improvements on Garnett Rd from the New Orleans St (101st St) to Houston St (81st St) — Roadway improvements on Albany St (61st St) from Garnett Ave to Aspen Ave (145th E Ave) — Roadway improvements on Omaha St (51st St) from Elm Pl (161st E Ave) to 9th St (177th E Ave) — Intersection improvements at Omaha St (51st St) & 9th St (177th E Ave) — Intersection improvements at Omaha St (51st St) & 23rd St (193rd E Ave or County Line Road)
ODOT (Trail Projects)	<ul style="list-style-type: none"> — Broken Arrow Creek Trail Phase I from Liberty Park Trail (Elm Pl & Creek Turnpike) to Ithica Pl (approximately 2 miles) — Broken Arrow Creek Trail Phase II along 1st Pl from Ithica Pl to Arrowhead Park on Washington St (approximately 0.8 miles) — Main Street Bikeways project from Washington St (91st St) to Kenosha St (71st St) (approximately 2 miles)
OTA	<ul style="list-style-type: none"> — Construction of new ramps at Aspen Ave (145th E Ave) and the Creek Turnpike — Liberty Park Trail Phases I, II & III along Creek Turnpike

The BUILD Project has the support of the Oklahoma Congressional delegation, including Senator Inhofe and Congressman Hern. The multitude of project partners and broader letters of support demonstrates the need for this project and that the project has the needed momentum to succeed.

The funding commitments toward this multi-stakeholder project and roles of each of the partners are outlined in **Table 10**.

Table 10. Partnership Support and Funding Commitments

Entity	Form of Support
City of Broken Arrow	<ul style="list-style-type: none"> — Local Match Funding of \$1.5 million through the City's local share of the Surface Transportation Program project, which is financed by the 2014 Streets General Obligation Bond — Local Match Funding of \$1.4 million through the City's 2008-2011 bond revenues — Project planning and management and grant recipient
ODOT	<ul style="list-style-type: none"> — Local Match Funding of \$4.0 million for bridge construction and lane widening construction — Construction of bridge and lane widening
INCOG	<ul style="list-style-type: none"> — Amending the Transportation Improvement Program for 2020-2023, Assist with mapping, analysis, STP funding, and agreements.
Tulsa County	<ul style="list-style-type: none"> — Support for the widening of the bridge — Previously widened the roadway to five lanes from Creek Turnpike to New Orleans Street, 3 miles south of this project

5. PROJECT READINESS

Technical Feasibility

The following **planning and design activities** have been completed to date:

- **National Environmental Policy Act (NEPA):** Preliminary plans have been completed for the Project, and the NEPA process was completed in May 2013. A Categorical Exclusion (CE) has been obtained, which ODOT is currently updating and will complete by February 2020. It is anticipated that no major changes have occurred, and the same CE will be issued.
- **Engineering Design:** Engineering Design will be complete in November 2019. The overpass and roadway are being designed by a professional engineering firm and the design has been reviewed by City and ODOT Engineers. The project features comply with all City and ODOT design standards.
- **Right-of-way (ROW) acquisition:** completed in March 2019
- **Relocation of Private Utilities:** currently underway to be completed by January 2020

Cost Estimate Reliability: The updated engineer's cost estimate was completed based on 95 percent design. The total cost figures were updated using the more recent "Inspection fee arrangement by ODOT & providing for appropriate contingencies" in order to be conservative with cost escalation.

Experience delivering federally funded projects: Federally funded projects delivered by the City of Broken Arrow include several STP projects and Transportation Alternatives Projects (TAP). Each of the projects were successfully executed by ODOT to the standards and satisfaction of the City of Broken Arrow. The provision to partner with ODOT through agreements to implement these projects has been beneficial and seamless to the partners.

Additional Leveraged Projects: The City of Broken Arrow has passed several bond issues recently to finance streets and public facilities near the project area. Tulsa County has also passed several sales tax funding packages to support funding for street and other facilities in the region. The Oklahoma Turnpike Authority is in the process of funding improvements to the Muskogee Turnpike southeast of this project. The Project has fueled the need for improvements to the transportation system at the west end of the Muskogee Turnpike. The \$43 million plus being funded over the next several years will add to the improvements of County Line Road and be a stimulus for the development of the area. This needed financing and funding has supported improvements near the project location, and demonstrates the City of Broken Arrow, the Oklahoma Turnpike Authority's, and Tulsa County's commitment to improving the County Line Road corridor.

Project Schedule

The Project is ready for quick implementation, with construction ready to begin in July 2020. The City of Broken Arrow and ODOT are partnered to complete the construction and improvements for this Project. Currently, the partnership is beginning the utility relocation phase which will be complete in January 2020. ODOT, working with the City of Broken Arrow, will be responsible for the majority of the project elements. All elements of the Project will be complete in January 2023

Table 11 below illustrates the project schedule.

Table 11. Project Schedule

	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023
Pre-Construction					
NEPA Categorical Exclusion*	Completed in 2013 (Update to be complete February 2020)				
Design & Engineering	→				
Build Grant Award/Agreement	●				
Construction					
Construction Bid**		●			
Right-of-way (ROW) Acquisition	Completed in March 2019				
Utility Relocation	→				
Roadway Construction		→			
Bridge Construction		→			
Construction Complete					●

*As noted in the following section, a NEPA update is required.

**The construction bid will be through ODOT's bidding process.

Required Approvals

Environmental Approvals: The NEPA process was completed in May 2013. A Categorical Exclusion (CE) has been obtained and further updated in 2016, however, since it has been more than three years, an update is anticipated before construction. ODOT is currently undertaking the update, which will be completed by February 2020. It is anticipated that no major changes have occurred and the same CE will be issued.

Legislative Approvals: The Project has received significant support from both state and local officials. The Appendix and Project website (<http://www.brokenarrowok.gov/841/BUILD-Grant>) include letters of support from INCOG, ODOT, and various other local entities.

State and Local Planning:

The following summarizes prior planning and funding initiatives that demonstrate the strong state and local support for the project.

Surface Transportation Program (STP): The City of Broken Arrow has been utilizing federal Surface Transportation Program (STP) funds awarded by INCOG since 2006, for planning, engineering, environmental, right-of-way, and utilities relocations.

Broken Arrow Comprehensive Plan: The City of Broken Arrow has recognized the importance of economic growth along State Highway 51 (the Broken Arrow Expressway) for years. The "section line" arterial streets (of which County Line Road is one) have also been included in Comprehensive Plan updates. The Tulsa County Major Street and Highway Plan has been incorporated into the

Comprehensive Plan. The Plan includes commercial and transitional nodes at most of the arterial street intersections and sets guidelines for development on arterial streets.

Broken Arrow Public Schools: The Broken Arrow Public Schools carefully plan their new schools, as well as expansions of existing schools and support facilities, to take advantage of transportation routes such as County Line Road. County Line Road, as previously mentioned, also serves as a major access route for Broken Arrow Public School buses with the bus depot being located just west of County Line Road and north of College.

4-to-Fix the County: In 2000 Tulsa County voters passed a quarter-penny sales tax to fund County roadway improvements, and the tax was renewed in 2004. The widening of County Line Road from the Creek Turnpike to New Orleans Street (101st St. S.) was accomplished using 4-to-Fix the County funds.

ODOT 8-Year Plan: The Oklahoma Department of Transportation through their 8-Year Plan programs improvements to State Highways such as SH-51.

Oklahoma Turnpike Authority (OTA): The OTA programs and plans improvements to the turnpike system, including interchanges and approaches such as the approach to the County Line Road bridge from the east. The OTA coordinates with ODOT.

Indian Nations Council of Governments (INCOG): The INCOG is the regional planning agency in the Tulsa Metropolitan area serves as the MPO. INCOG also oversees a regional bicycle planning, project development for communities. This project is a part of the regional plan, named the 'GO Plan' for bike/pedestrian improvements. There are several signed routes that will connect to the proposed trail on the east side of the project.

Northeastern State University (NSU): Northeastern State University - Broken Arrow campus has a master plan that is being implemented. This project would enhance their plans to grow their Broken Arrow Campus located two miles south and half a mile east.

Assessment of Risks and Mitigation Strategies

There are a few risks associated with the project implementation, however, this is a mitigation plan in place for each of the risks. The following **Table 12** represents the top three risks associated with the project and the mitigation plan for each.

Table 12. *Risks and Mitigation Strategies*

Project Risk Item	Risk	Mitigation Plan
Scheduling	Risk with scheduling bridge construction around swallows nesting and bats roosting under bridge	Schedule bridge construction around swallow nesting season and provide netting option as allowed
Utility Relocation	The Oklahoma Natural Gas, as well as other utilities, relocation process takes a large amount of time and could cause delays in construction	Provided advanced notice to Oklahoma Natural Gas and gas line relocation is near completion. Other utility relocations are on schedule to be complete by January 2020
Cost Overrun	With any project, cost overruns are a potential, especially if the project is delayed	City of Broken Arrow commits to paying for the cost overruns through local funds

6. BCA RESULTS

An economic benefit-cost analysis (BCA) was conducted for the Project using a model developed that follows USDOT's 2019 Benefit-Cost Analysis Guidance for Discretionary Grant Programs. The analysis found that the Project has a **net present value of \$4.8 million** (in 2017 dollars, discounted at 7 percent), resulting in a discounted **benefit cost ratio of 1.3**. As such, the Project is expected to generate economic benefits that outweigh its costs. **Table 13** shows the overall results of the BCA for the Project. The BCA Technical Memorandum can be found in Appendix A and on the Project website (<http://www.brokenarrowok.gov/841/BUILD-Grant>).

Table 13. Summary Project Benefits by Type (Millions of 2017 dollars)

Type of Benefit	Undiscounted	Discounted @ 7%
Costs		
Capital Costs	\$18.9	\$15.2
PS&E (previously incurred) *	\$1.3	\$1.1
Capital Costs (including previously incurred costs)	\$20.2	\$16.3
Evaluated Benefits		
Accident Cost Reduction	\$11.2	\$4.5
Reduced Agency R&R Costs	\$3.9	\$1.8
Residual Value	\$2.7	\$0.5
Travel Time Savings	\$35.0	\$12.9
Fuel Cost Savings	\$2.4	\$0.9
Emissions Reduction	\$0.7	\$0.4
Total Evaluated Benefits in 2017\$	\$55.9	\$21.1
Benefits - Costs	\$35.7	\$4.8
Benefit-Cost Ratio (BCR)	2.6	1.3
Internal Rate of Return (IRR)	10%	N/A

* Plans, Specifications, and Estimates (PS&E) were included in the BCA for compliance with USDOT, however, this amount is included in the request for funding (Section 3. Grant Funds and Sources/Uses of Project Funds)

Costs

The only costs reflected in the Project's BCA are the capital costs of construction as well as the costs that have already been incurred to support development of plans, specifications, and estimates (PS&E). Under a No-Build scenario, the PS&E costs have already been incurred, but USDOT's guidance is to include previously incurred costs in the benefit-cost ratio. In the No-Build scenario, the capital costs of construction would not be incurred. The total capital costs of the Project amount to \$16.3 million (2017 dollars, discounted at 7 percent).

The capital costs of construction amount to \$18.9 million (2017 dollars); construction will occur between FFY2020 and FFY2023. The capital construction costs include: the cost to construct the roadway (\$10.6 million 2017 dollars) and the cost to construct the bridge (\$4.6 million 2017 dollars) in addition to a 15 percent contingency and a 10 percent management and inspection cost. The PS&E costs (\$1.3 M in 2017

dollars) were incurred in FY 2018 and have been applied to the first year of the Project analysis period, FY 2020, per USDOT instruction, for the purpose of the BCA.

Benefits

The key benefits of Project include the following: travel time savings, safety benefits, reduced agency rehabilitation and repair (R&R) costs, residual value of the bridge, fuel savings, and emission reductions.

Travel Time Savings

Time savings benefits apply primarily to automobile and truck travel. Time savings benefits are two-fold for this Project; travelers during off-peak hours will realize time savings as a result of increased speed limits, and travelers during peak hour travel will realize additional savings as a result of the increased capacity of the roadway. Speed limit increases (from 40 mph to 45 mph) are possible from a safety perspective because the new roadway will be less curvy than the original roadway. Increased capacity is a result of widening the roadway from two to five lanes. Based on current speed patterns within the corridor, travelers would save 50 seconds per passenger per trip during peak hour travel and 30 seconds per passenger per trip during off-peak hour travel. The analysis concluded that the time savings benefits for this Project would be \$12.9 million (2017 dollars, discounted at seven percent).

Safety

Safety benefits of this Project are expected as a result of widening the roadway from two to five lanes. A study from the Texas Transportation Institute at Texas A&M, "Comparisons of Crashes on Rural Two-Lane and Four-Lane Highways in Texas" supported a 20 percent crash reduction as a result of the roadway widening (for an undivided roadway). As a result, the Project anticipates \$4.5 million (2017 dollars, discounted at seven percent) in safety benefits due to accident reductions, which amounts to approximately 12 fewer accidents per year.

Reduced Agency Rehabilitation and Repair Costs

If the Project does not take place, the City of Broken Arrow will need to do an overlay of the road in FY 2020, FY 2027, FY 2034, and FY 2041, which would cost \$0.5 million, \$1.5 million, \$1.5 million, and \$0.5 million (2019 dollars), respectively. However, if the Project takes place according to the proposed schedule, with construction commencing in FFY 2020 and ending in FFY 2023, there will be no need for an overlay until the roadway has exceeded its useful life, in FFY 2043. Per USDOT guidance, the analysis period ends in FY 2042, the last year before the roadway exceeds its useful life. As a result of the foregone overlay costs, the Project would generate \$1.8 million (2017 dollars, discounted at seven percent) in reduced R&R costs. Note that there is no notable difference between O&M costs in the Build and No-Build scenarios.

Residual Value of the Bridge

The design life of the roadway and bridge will be 20 years and 50 years, respectively. Per USDOT instruction, the Project analysis period is equal to the construction period (three years) plus the useful life of the roadway (20 years), for a total Project analysis period of 23 years (FY 2020 – FY 2042). At the end of the Project analysis period, the bridge will only be roughly halfway through its design life, therefore the agency realizes the additional benefit of the residual value of the bridge. The original value of the bridge will be \$4.6 million (2017 dollars), amounting to \$0.5 million (2017 dollars, discounted at seven percent) in residual value benefits through the end of the analysis period.

Emission Reductions

Widening the roadway will result in improved traffic flow through the corridor, which will reduce idling, including the left turn lane, and reduce greenhouse emissions and localized tail-pipe pollutants. The Project is expected to generate \$0.4 million (discounted at 7 percent) in reduced emissions as a result of alleviating congestion by increasing the capacity of the roadway.

Fuel Savings

Fuel savings of this Project are expected as a result of the new roadway which will be straighter and wider, allowing users to safely travel at uncongested speeds. Vehicle miles traveled in the corridor are not expected to change between the Build and No-Build scenarios, for the forecast year, even though there is an anticipated increase from the present day. As such, the project is expected to generate fuel savings benefits for drivers, as the slight increase in average speeds will be more fuel efficient than current speeds under the No-Build scenario. The fuel cost savings associated with the Project would be \$0.9 million (discounted at 7 percent), because of more efficient average travel speeds in the corridor.

APPENDICES

All appendices are hosted on the Project website: <http://www.brokenarrowok.gov/841/BUILD-Grant>.

- **Appendix A:**
 - Benefit-Cost Analysis Technical Memo
 - Benefit-Cost Analysis spreadsheet model
- **Appendix B:**
 - Part 1: Letters of Support
 - Part 2: Letter of Financial Commitment
- **Appendix C: Related Plans**
 - ODOT's 8-Year Construction Work Plan